CLAIMS

1. A mobile station for a packet switching radio network which includes a Voice over Internet Protocol application layer and Internet Protocol Stacks including Real Time Protocol, Transport Control Protocol, User Datagram Protocol and Internet Protocol layers, further comprising a compressor/ decompressor to compress voice data, and means to send voice data and call signalling data separately and in different data formats to the link layer and the air interface of the mobile station.

2. A mobile station according to Claim 1 in which the compressor/ decompressor is arranged between the link layer and the IP layer, the compressor/ decompressor receiving both the voice data and the call signalling data.

3. A mobile transceiver according to Claim 1 in which the compressor/ decompressor is arranged between the link layer and the Voice over IP layer, the compressor/decompressor receiving the voice data.

4. A packet switching radio network comprising a plurality of mobile stations according to any one of Claims 1 to 3 and at least one network element in which there is compressor/decompressor means arranged to receive compressed voice data.

5. A network according to Claim 4 in which the compressor/decompressor is arranged towards the edge of the core network adjacent the backbone network.

6. A network according to Claim 4 or Claim 5 in which the voice and data packets are routed through the Internet.

7. A network according to Claim 5 or Claim 6 in which the voice and data

packets are routed through a gateway to the public switched telephone network.

8. A method of operating a packet switching radio network to provide voice services comprising separating voice data from call signalling and other data, whereby each packet containing voice data can be provided with compressed or removed RTP/UDP/IP headers.

9. A method according to Claim 8 in which the voice packets for VoIP applications are sent as a link layer payload directly without going through IP layers.

10. A method according to Claim 8 or Claim 9 in which each voice packet header comprises a cyclically-reset timeclick_number representing the sampling time of the packet payload; the timeclick_number being increased by 1 for each sample duration time; and in which the headers are decompressed by counting the reset cycles by means of a separate clock; together with the received timeclick_number to provide the sequence number and timestamp of a decompressed header.

11. A method according to Claim 8 or Claim 9 comprising in a mobile station removing combined RTP/UDP?IP headers and placing voice data in RLC/MAC payload; and decompressing received voice packets by using an internal clock to obtain a timestamp value, and increasing the sequence number by 1 for consecutive packets.

12. A method according to Claim 8 or Claim 9 comprising, in a mobile station, removing combined RTP/UDP/IP headers and placing voice data in RLC/MAC payload; and decompressing received voice packets by determining packet inter-arrival times to detect loss of any packet, and if such loss is detected, adjusting the timestamp value and sequence numbers of RTP headers of

subsequently received voice packets accordingly.

13. A method according to any one of Claims 8 to 12 in which the compression state of a voice packet header is established by making use of call set-up information over an out-of-band communications protocol between a mobile station and a compression/decompression in the network.

14. A method according to any one of Claims 8 to 13 further comprising providing an out-of-band communications protocol between a serving compressor/decompressor in the network and other compressor/decompressors in the network, and, on handover of the call, exchanging compression context information relating to a current call between the serving compressor/ decompressor and a new serving compressor/decompressor.

15. A method according to Claim 14 in which the exchanged compression context information includes the timestamp value of the last decompressed RTP packet.

16. A method according to Claim 15 in which the network is a Code Division Multiplexing Access network having a soft-handover facility, and preparing and performing exchange compression context information during a soft-handover period.

17. A first method of compressing and decompressing headers for a packet switching network comprises providing in each compressed header a cyclically-reset timeclick_number representing the sampling time of the packet payload; increasing the timeclick_number by 1 for each sample duration time, counting the reset cycles, and from the count of reset cycles and a received timeclick_number, providing a sequence number and timestamp for providing a decompressed header.

18. A method according to Claim 17 further comprising including in each compressed header an M bit; and decompressing a header when no M bit is received by increasing the packet sequence number of the decompressed header by the difference of the timeclick_numbers between the packet for which no M bit is received and the last previously received packet having an M bit.

19. A second method of compressing and decompressing headers for a packet switching network comprises removing combined RTP/UDP/IP headers and placing data in RLC/MAC payload; and decompressing received packets by use of an internal clock to obtain a timestamp value, and increasing the sequence number by 1 for consecutive packets.

20. A second method according to Claim 19 in which the network is a frame relay network.

21. A second method according to Claim 19 in which the network is an Asynchronous Transmission Made network.

22. A method of establishing a compression state of a packet header in a packet switching network by making use of call set-up information over an out-of-band protocol.